Subject Index

Activity, Graves’ orbitopathy
  clinical assessment 8–11, 83
definition 6, 7, 81, 82
laboratory tests 13, 14
management guidelines 13
Age
distribution of Graves’ orbitopathy 35
effects on Graves’ orbitopathy
  presentation 4
Anterior orbital septum (AOS) 5
Antithyroid drug therapy, Graves’
orbitopathy outcomes 100, 101, 103
Apical crowding, imaging 59–61
Artificial tears, Graves’ orbitopathy
  management 90
Azathioprine, moderately severe Graves’
orbitopathy management 140–142
Botulinum toxin, Graves’ orbitopathy
  management 91, 189, 190
Caroticocavernous fistula, differential
diagnosis 75
Caruncle, inflammation assessment 10, 11
CD20, therapeutic targeting 238–240
Chemosis, assessment 9
Childhood Graves’ orbitopathy
  clinical presentation 222
epidemiology 222, 223
severity 222–224
treatment 224–226
Ciameixone, moderately severe Graves’
orbitopathy management 140, 142
Clinical Activity Score (CAS) 11, 12, 83
Color vision, assessment 18, 19
Combined thyroid-eye clinic
definition 96, 97
  fast-track for Graves’ orbitopathy patients
  98, 99
  multidisciplinary approach advantages
  97, 98
  patient support groups 98
Computed tomography (CT)
  Graves’ orbitopathy diagnosis 71
  orbital imaging 57–59
Conjunctival edema, see Chemosis
Conjunctival redness, assessment 8, 9
Corneal ulceration
  Clinical Activity Score 11, 12
  eyelid surgery 190
  Graves’ orbitopathy diagnosis 69
  overview 3, 6
Corticosteroids, see Steroid therapy
Cosmetic surgery, definition 160
CTLA-4
  Graves’ orbitopathy susceptibility locus 86
  therapeutic targeting 53, 239
Cyclosporine, moderately severe Graves’
orbitopathy management 138, 139
Delayed decompression-related reactivation
  (DDRR) 172
Diabetes, Graves’ orbitopathy risks 38, 39
Diagnosis, Graves’ orbitopathy
  clinical findings
    corneal ulceration 69
Diagnosis, Graves’ orbitopathy (continued)
clinical findings (continued)
eyeball motility restriction 69
eyelid retraction 68
eyelid swelling 67, 68
proptosis 69
visual acuity 69, 70
criteria 70
errors in complex cases 178, 179
laboratory tests 70, 71
overview 66
Differential diagnosis
carotico cavernous fistula 75
non-Hodgkin lymphoma 76
orbital meningioma 72
orbital myositis 72–74
Diplopia, orbital decompression surgery
complication 173
Diuretics, Graves’ orbitopathy management 91
Double vision 1, 173
Dysthyroid optic neuropathy (DON)
apical crowding imaging 59–61
assessment 18–23, 156
blindness outcomes 158
clinical features 2, 3, 6, 154, 155
definition 153
evidence-based management 157
ophthalmological signs 155
risk factors 22, 153
surgical management 157, 158
urgent treatment indications 156, 157
vision effects 22

Epidemiology, Graves’ orbitopathy
age and sex distribution 35
childhood Graves’ orbitopathy 222, 223
comorbidity
non-ocular 38, 39
ocular 37, 38
ethnic differences 35
prevalence 34, 35
risk factors 35, 36
trends 34, 35
Euthyroid Graves’ orbitopathy, management 218
Evidence-based medicine
dysthyroid optic neuropathy management 157
historical perspective 252, 253
moderately severe Graves’ orbitopathy
management 148, 149
Eyelid erythema, assessment 8
Eyelid retraction
differential diagnosis 68
Graves’ orbitopathy diagnosis 68
Eyelid surgery
complications 195–198
debulking and blepharoplasty 198
indications 188–190
orbital decompression effects on lid
retraction 190, 191
spacer materials 196, 197
squint surgery influence on lid
configuration 191, 192
techniques
lower lid 196
upper lid 193–195
Eyelid swelling
assessment 9, 10
differential diagnosis 67
Graves’ orbitopathy diagnosis 67, 68
Eye muscle surgery
affected muscle identification 176–178
complications 185, 186
expectations and outcomes 182, 183
indications 179–182
planning 183–185
timing 182
Fibroblast, therapeutic targeting 52, 53
Flurometholone, Graves’ orbitopathy
management 90
Fundoscopy, optic neuropathy assessment
19
Genetic susceptibility, Graves’ orbitopathy
4, 50, 51
Glaucoma, see Primary open-angle
GLAUCOMA
Globe subluxation 1, 219
Glucocorticoids, see Steroid therapy
Graves’ disease
Graves’ orbitopathy frequency 29
localized myxedema 31, 32
thyroid acropachy 32
Graves, Robert James 246
Guanethidine, Graves’ orbitopathy management 91

Hyaluronic acid, lower lid injection 243

Hyperthyroidism
Graves’ orbitopathy relationship 27–29, 78, 89
history of study with proptosis 248, 249

Hypothyroidism
Graves’ orbitopathy relationship 79, 80, 89
temporary hypothyroidism after hyperthyroidism treatment 105, 106

Insulin-like growth factor-1 (IGF-1) receptor
antibodies and Graves’ orbitopathy 47
therapeutic targeting 239

Interleukin-1 (IL-1), therapeutic targeting 53, 239
Interleukin-6 (IL-6), therapeutic targeting 53, 239

Intravenous immunoglobulin (IVIg), moderately severe Graves’ orbitopathy management 139, 140, 142, 143

Ketorolac, Graves’ orbitopathy management 90

Lantreotide, see Somatostatin analogs

Magnetic resonance imaging (MRI)
Graves’ orbitopathy diagnosis 71
orbital imaging 58, 59, 63

Mild Graves’ orbitopathy
antioxidant therapy 116, 117
intra-orbital involvement 111
oral steroid therapy 114
progression 111, 112
radiation therapy 115, 116
treatment versus wait and see 112, 113

Moderate to severe Graves’ orbitopathy
azathioprine therapy 140–142
ciamexone therapy 140, 142
combination steroid and radiotherapy 135–138
cyclosporine therapy 138, 139
evidence-based therapeutic recommendations 148, 149
immunosuppression indications 120, 121
intravenous immunoglobulin therapy 139, 140, 142, 143
intravenous steroid therapy adverse effects 130
outcomes 126–130
oral steroid therapy 121–125
radiation therapy outcomes 131–133
protocol 133, 134
safety 134, 135
retrobulbar injection of steroids 130
somatostatin analog therapy 144–147
Myasthenia gravis (MG), Graves’ orbitopathy risks 39

Myxedema, Graves’ disease association 31, 32

Natural history, Graves’ orbitopathy ‘burn’ out 84, 85
euthyroidism restoration 78, 79
hyperthyroidism 78
hypothyroidism 79, 80
mild disease progression 111, 112
modifying factors 85, 86
recurrence 85
return to normality 84, 85
Rundle’s curve 80
treatment guidance 83, 84
typical course 80, 81

Non-Hodgkin lymphoma, differential diagnosis 76
NOSPECS classification
class frequencies 14–16
overview 14, 15
severity assessment 14, 16–20, 83

Oculescan, orbital imaging 62
Octreotide, see Somatostatin analogs

Ocular motility impairment
affected muscle identification 176–178
Graves’ orbitopathy diagnosis 69
mechanisms on Graves’ orbitopathy 176
presentation 3
surgery, see Eye muscle surgery
Optic neuropathy, see Dysthyroid optic neuropathy

Orbit
imaging
- apical crowding 59–61
- computed tomography 57–59
- indications 57
- magnetic resonance imaging 58, 59, 63
- octreoscan 62
- positron emission tomography 64
- ultrasonography 61, 62
- immune reactions 48–50
-thyroid autoimmunity and orbit pathology 47

Orbital decompression surgery
- aims
  - functional aims 164, 165
  - rehabilitative symptomatic aims 165–167
- childhood Graves’ orbitopathy management 226
-compressions
  - delayed decompression-related reactivation 172
  - prevention 172, 173
dysthyroid optic neuropathy management 157, 158
-lid retraction effects 190, 191
-overview 163
- prospects 241–243
-technique
  - fat removal 167, 170, 171
  - osteotomy 167, 170, 171
  - rehabilitative surgery 168, 169
Orbital meningioma, differential diagnosis 72
Orbital myositis, differential diagnosis 72–74

Parry, Caleb Hillier 246

Pathogenesis, Graves’ orbitopathy
- clinical manifestation mechanisms 5, 6, 44, 45
- orbital tissue pathology
  - adipogenesis 43
  - early inflammatory changes 42, 43
  - glycosaminoglycan production 43, 44
-overview 41, 42
-triggers 45–47
Patient support groups 98
Pentoxifylline, mild Graves’ orbitopathy management 116
Perimetry, optic neuropathy assessment 19
Photophobia 1
Plica, inflammation assessment 10, 11
Positron emission tomography (PET), orbital imaging 64
Prevalence, Graves’ orbitopathy and trends 34, 35
Prevention, Graves’ orbitopathy
  - general strategy 229, 230
  - primary prevention 230, 231
  - primary, secondary, and tertiary prevention definitions 229
  - secondary prevention 231–233
  - tertiary prevention 233, 234
Primary open-angle glaucoma (POAG), Graves’ orbitopathy risks and management 37, 38
Proptosis
- assessment 20
- differential diagnosis 69
Graves’ orbitopathy diagnosis 69
Ptosis 3
Pupil response 19

Quality of life (QoL)
definition 201
Graves’ orbitopathy
- GO-QoL questionnaire
  - components 204–206
  - findings 206
  - recommendations 209, 210
  - therapeutic outcome measurement 207, 208
  - health-related quality of life 203, 204
  - response shift 206, 207
  - restoration after treatment 208, 209
  - usefulness of measurements 201–203

Race
- effects on Graves’ orbitopathy
  - presentation 4
epidemiology of Graves’ orbitopathy
35
Radiation therapy
mild Graves’ orbitopathy management
115, 116
moderately severe Graves’ orbitopathy
management
combination steroid and radiotherapy
135–138
outcomes 131–133
protocol 133, 134
safety 134, 135
response classification 252
Radioiodine
childhood Graves’ orbitopathy
management 225
Graves’ orbitopathy outcomes
101–104
Graves’ orbitopathy trigger 45
guidelines 106
risk factors in Graves’ orbitopathy
progression 233
total thyroid ablation 107, 108
Rehabilitative surgery
definition 160
orbital decompression surgery, see
Orbital decompression surgery
patient selection 161, 162
steps 161
timing 161
Rituximab, Graves’ orbitopathy
management 238–240
Rundle, F.F. 249–252
Rundle’s curve 80, 249
Severity, Graves’ orbitopathy
assessment 14, 16–20, 83
childhood Graves’ orbitopathy
222–224
definition 6, 7, 82, 83
treatment guidance 92, 93
Sex distribution, Graves’ orbitopathy
35, 36, 86
Signs, Graves’ orbitopathy
common signs 1, 2
history of study 247, 248
severity assessment 14
unusual signs 2, 3
Smoking
cessation
benefits 89
promotion 234
Graves’ orbitopathy risks 36, 51, 52, 85, 86
primary prevention of Graves’
orbitopathy 230, 231
secondary prevention of Graves’
orbitopathy 233
Somatostatin analogs
childhood Graves’ orbitopathy
management 225
moderately severe Graves’ orbitopathy
management 144–147
Steroid therapy
mechanism of action 237, 238
mild Graves’ orbitopathy 114
moderately severe Graves’ orbitopathy
combination steroid and radiotherapy
135–138
intravenous steroid therapy
adverse effect 130
outcomes 126–130
oral steroid therapy 121–125
retrobulbar injection 130
Strabismus, see Ocular motility
impairment
Surgery, see Eyelid surgery; Eye muscle
surgery; Orbital decompression surgery;
Rehabilitative surgery
Symptoms, Graves’ orbitopathy 1
Thyroglobulin, antibodies in Graves’
orbitopathy 46
Thyroid acropachy, Graves’ disease
association 32
Thyroidectomy
childhood Graves’ orbitopathy
management 225
Graves’ orbitopathy outcomes 102, 103,
107, 108
Thyroid-stimulating hormone (TSH)
receptor
antibodies and Graves’ orbitopathy 30,
31, 46, 47, 50, 70, 71, 85
therapeutic targeting 241
Trauma, Graves’ orbitopathy trigger 45
Tumor necrosis factor-α (TNF-α),
therapeutic targeting 53, 238, 239

Ultrasonography, orbital imaging 61, 62
Unilateral Graves’ orbitopathy
clinical presentation 217
mechanisms 212–216

progression to bilateral disease
216, 217
treatment 217, 218

Very severe Graves’ orbitopathy, see
Dysthyroid optic neuropathy
von Basedow, Karl Adolph 246